

## CONTENT STANDARD 11: Engineering Design

*Students will be able to apply the engineering design process to achieve desired outcomes across all technology content areas.*

### K - 12 PERFORMANCE STANDARDS

Educational experiences in **Grades K-4** will assure that students:

- define *design*; and
- construct, evaluate and modify a model or prototype.

Educational experiences in **Grades 5-8** will assure that students:

- identify the elements of design;
- discuss the differences between problem solving and engineering design strategies;
- explain the role of creativity in the engineering design process;
- describe conceptual design, embodiment design and detail design and identify their roles in the engineering process;
- explore a variety of creativity-enhancing techniques;
- develop conceptual designs for transportation, communications, production and bio-related problems;
- use a variety of creativity-enhancing techniques in conceptual design situations;
- explore techniques used to refine conceptual design sketches; and
- develop preliminary product layouts.

Educational experiences in **Grades 9-12** will assure that students:

- differentiate between the problem solving and engineering design processes;
- describe the detail design phase of the engineering design process;
- demonstrate an ability to complete a detail design for any given embodiment design;
- apply a variety of creativity-enhancing techniques in completing a conceptual, embodiment and detail design solution; and
- apply the full engineering design process to produce a product on time that meets all initial criteria, using appropriate tools and material resources.